EASTERN RESEARCH GROUP, INC.

MEMORANDUM

TO: Bill Maxwell, U.S. Environmental Protection Agency, OAQPS (MD-13)

FROM: Mary Lalley, ERG/MOR

DATE: October 10, 1997

SUBJECT: Final Summary of September 18, 1997 Meeting of the ICCR Process Heater Work Group

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1.0 PURPOSE

The purpose of the meeting was to allow meeting attendees to discuss various activities of the ICCR Process Heater Work Group. Topics of discussion included responding to suggestions from the Coordinating Committee, subcategories, good combustion practices, issue tracking, schedule, preliminary MACT floors, and emission testing.

2.0 LOCATION AND DATE

The meeting was held on September 18, 1997 in Durham, North Carolina.

3.0 MEETING ATTENDEES

Meeting attendees include representatives of the OAQPS Emission Standards Division, trade associations, and environmental interest groups. A complete list of attendees (with their affiliation) is included as attachment 1.

4.0 SUMMARY OF DISCUSSION

Meeting discussion generally followed the agenda provided as attachment 2. Discussions are summarized in the following sections:

4.1 Response to Coordinating Committee

4.2 Subcategories

4.3 Process Heaters Covered By Another MACT

4.4 Good Combustion Practices

4.5 Process Heater Work Group Issues

4.6 Breakdown of Process Heaters by SIC and Fuel Type

4.7 Industries Not Represented by the Work Group

4.8 Schedule

4.9 MACT Floor

4.10 Testing

4.11 Work Group Stakeholder Co-Chairs

4.1 Response to Coordinating Committee

The EPA co-chair asked the Work Group for a response to the Coordinating Committee's request that the Work Group consider the information presented the previous day in the dioxin primer. One Work Group member suggested that the Work Group respond that the dioxin information provided will be applied on a subcategory basis, rather than universally.

One Work Group member suggested the following response to the Coordinating Committee: The Process Heater Work Group has adopted direct-fired and indirect-fired as two subcategories. The indirect-fired category is further subcategorized into gas-fired and other. For indirect gas-fired process heaters, the MACT floor is no add-on control and good combustion practices. Additionally, the dioxin primer reaffirmed previous findings regarding gas-fired process heaters. One Work Group member suggested modifying the response to include a subcategory for indirect- and direct-fired process heaters that are already covered by another MACT.

An EPA representative stated that while some people who attended that dioxin primer thought the information provided to be useful, others pointed out that the emission data is incomplete and based on testing of municipal waste combustors.

4.2 Subcategories

The Work Group discussed at length the need for and possible approaches for developing subcategories. An industry representative stated that subcategories must be developed before the information presented at the Coordinating Committee's dioxin primer can be applied. Another industry representative suggested that both issues could be considered simultaneously. An EPA representative pointed out that some subcategories have already been developed and referred to the approach flow diagram presented at the June 19, 1997 Process Heater Work Group meeting (Summary of June 19, 1997 Meeting of the ICCR Process Heater Work Group, attachment 3). Several Work Group member agreed that the diagram is a good basis for subcategories but needs to be expanded. Work Group members discussed expanding the category for gas-fired indirect process heaters.

One Work Group member stated that the gas subcategory should be divided into two subcategories: hydrocarbon gas and other gas. The Work Group member explained that the hydrocarbon gas category includes natural gas and refinery gas. An industry representative stated that any gas that has characteristics that are different than natural gas and refinery gas will be dealt with separately. The industry representative suggested that the quality of gas in the hydrocarbon category should be defined. One industry representative provided that, at the previous day's dioxin presentation, it was stated that chlorine content does not significantly affect dioxin emissions. Another industry representative stated that other data suggest that chlorine does affect dioxin emissions.

One Work Group member asked if the ranking document provided at the previous day's Coordinating Committee meeting suggested that subcategories should be fuel-related. An EPA representative commented that subcategories may be fuel-related in some cases and control-driven in others.

One Work Group member suggested that listing all types of process heaters may reveal obvious subcategories and that these subcategories may not be based on fuel. Another Work Group member stated that fuel is the most important issue for indirect-fired process heaters. An EPA representative provided that one proposed rule requires all combustion devices, regardless of fuel, to meet the same emission limit. One industry representative questioned whether this

approach is feasible for process heaters, as emission test data would be required. Other industry representatives stated that emissions and control equipment vary depending on fuel type.

Several Work Group members suggested that subcategories may be determined based on fuel initially and if it is found that the same MACT floor, for example, good combustion practices, applies to more than one subcategory, they can be combined. One Work Group member predicted that good combustion practices for process heaters burning light ends will not be the same as good combustion practices for process heaters burning heavy ends.

One Work Group member pointed out that the combustion of some non-gaseous materials considered "wastes" will be subject to regulation through section 129 of the Clean Air Act. Another Work Group member suggested that process heaters burning waste should be a subcategory.

An EPA representative suggested that it is not necessary to rigorously define subcategories in order to determine the preliminary MACT floor. The EPA representative added that the MACT floor is dependent on existing control devices, not emissions. The EPA representative suggested that the Work Group determine preliminary MACT floors, and then examine issues to determine if it is necessary to consider alternatives more stringent than the MACT floor. Engineering judgement or testing may be used to help in determining if a more stringent alternative is justifiable.

One Work Group member stated that EPA is not required to develop a MACT standard for every process, but is mandated to address "significant " sources. The Work Group member stated that some categories will have HAP emissions but will not be subject to a standard. The Work Group member suggested that either the Title V permit process or a State Implementation Plan will result in some level of control for such sources.

One industry representative asked why the Work Group is attempting to develop subcategories if EPA is going to develop emission limits. An EPA representative stated that standards developed may not necessarily be emission limits. The EPA representative explained that the standards may be work practices or pollution prevention measures. The EPA representative stated that there are standards in place that are violated if work practices are not followed. The EPA representative added that some VOC standards require facilities to establish,

through testing, flowrates, temperatures and residence times that ensure a certain level of emissions. The facilities are required to monitor flowrate, temperature and residence time, not VOC emissions, to show compliance.

4.3 Process Heaters Covered by Another MACT

One Work Group member asked how indirect-fired process heaters that could possibly be covered by another MACT because they burn process vents will be addressed. Another Work Group member stated that he thought, in general, any process heater covered by another MACT would not be covered by the ICCR. An industry representative explained that the Work Group recommended that such process heaters not be covered by the ICCR, but that no official decision has been made.

A Work Group member requested clarification on whether the recommendation addressed direct or indirect process heaters. An EPA representative explained that some MACT standards, such as the one for ethylene processing, will address indirect-fired process heaters associated with the process being covered. The EPA representative further explained that EPA is investigating whether other MACT standards specifically cover the associated process heater.

An industry representative stated that the Hazardous Organics NESHAP (HON) includes monitoring, recordkeeping and reporting requirements for process heaters to ensure effective incineration of process vents. A representative of the pulp and paper industry stated that standards developed for his industry purposely did not include process heaters because it was assumed these would be covered by the ICCR. A representative of the metals industry provided that process heaters were considered in development of the primary and secondary aluminum MACT standards, but not regulated because they were not considered to be significant sources of HAP emissions. The Work Group member asked if these heaters wold now be scrutinized again through the ICCR. A representative of the petroleum refining industry stated that process heaters associated with the processes covered by the first refinery MACT were purposely not addressed by the MACT because of the ICCR. The refinery representative added that the second refinery MACT standard, currently being developed, will address process heaters. An EPA representative pointed out that the requirements of sections 111 and 129 of the Clean Air Act may not have been addressed for process heaters covered by another MACT.

Several industry representatives stated that it is desirable to avoid having one unit be subject to more than one MACT standard. Another industry representatives stated that this may be difficult to achieve for units subject to a MACT standard that covers a process vent routed to a combustion device but not the combustion device itself.

4.4 Good Combustion Practices

One Work Group member asked if a standard could require "good combustion practices" or if the standard would be more specific. An EPA representative stated that it would be necessary to define "good combustion practices". One industry representative stated that they can define good combustion practices. Another industry representative suggested that the good combustion practices may apply to both indirect-fired process heaters and direct-fired process heaters in which the process does not contribute to HAP emissions.

One Work Group member asked if the Boiler Work Group should be involved in developing the definition of good combustion practices. Another Work Group member stated that there will be similarities and differences in good combustion practices for boilers and process heaters.

The Work Group decided to form a subgroup to define good combustion practices. Members of the subgroup include Jim Seebold and Chuck Feerick. The subgroup agreed to a tentative date of January 1998 for completion of the first draft of the definition.

In response to one Work Group member's question regarding how the Work Group will address pollution prevention, another Work Group member suggested that pollution prevention may be addressed as part of good combustion practices.

4.5 Process Heater Work Group Issues

Mary Lalley of Eastern Research Group presented a summary table of issues and questions that have been raised at Process Heater Work Group meetings. The table includes each issue, the resolution, any action taken to resolve the issue, a reference for each action item that provides documentation of activities or decisions, and anticipated and actual completion dates. Work Group members suggested changes to the table, including using the section of the table reserved for the resolution to track intermediate progress. The issue table will be revised and posted to the Process Heater Work Group section of the ICCR Bulletin Board.

4.6 Breakdown of Process Heaters by SIC and Fuel Type

Mary Lalley presented several tables of data derived from the process heater section of the ICCR inventory database. The first table, included as attachment 3, shows the number of facilities and process heaters in the database for each two-digit Standard Industrial Classification (SIC) code. The table also shows how many heaters in each SIC can be assigned to each of the three categories developed by the Work Group. Ms. Lalley explained that the assignments were made based on the source classification code (SCC) reported for the unit in the database. The three categories of process heaters are: Table 1, Units Covered by the ICCR; Table 2, Units Covered by Another MACT Standard; and Table 3, Direct-Fired Units That Are Not Covered by Another MACT Standard. One Work Group member pointed out that, because the units were counted using the SCC, one unit may be represented more than once on the table because one unit may have more than one SCC. Ms. Lalley agreed and stated that approximately 1,500 of the 35,000 are counted twice.

The second table presented is included as attachment 4. Ms. Lalley explained that this table presents the number of units in the "Table 1" category that fire each reported fuel type. Unit counts are also divided by two-digit SIC code. Highlighted on the table are the 11 two-digit SIC codes with the greatest number of process heaters. Ms. Lalley provided a similar table for units in the "Table 3" category which is included as attachment 5.

4.7 Industries Not Represented by the Work Group

Mary Lalley provided a handout to the group that provides general information for the six of the 11 two-digit SIC groupings discussed in section 4.6. These six two-digit SIC groupings were identified as including industries not represented by the Process Heater Work Group. The handout, attachment 6, includes a listing of companies, plant descriptions and combustor descriptions found under the SIC code in the database. Also included in the handout are descriptions of associations that may represent the industries listed.

One industry representative asked if the American Automobile Manufacturer's Associated was contacted and asked to participate in the ICCR. One Work Group member stated that they were contacted and that they responded that they only have small units. One meeting attendee stated that it is not necessary to reach out to industries that are not represented because they will

have an opportunity to participate through the comment process once rules are proposed. An EPA representative pointed out that there is a limited time period allowed for EPA to receive and respond to comments and that the comments received may be difficult to address within that time period if they are significant. The EPA representative also pointed out that the Economic Analysis Work Group requires industry-specific information and should be informed of the industries that are not represented.

Norbert Dee offered to contact a member of the Automobile Manufacturer's Association and solicit their participation. Oliver Stanley offered to contact representatives of the snack food manufacturing industry. One Work Group member suggested that a letter should be sent to industries that are not participating. Another Work Group member suggested that the letter should be from EPA. Several Work Group members agreed that the letter should be sent to trade associations rather than individual companies.

4.8 Schedule

Lee Gilmer led discussion of the Work Group's schedule. Mr. Gilmer referred to a timeline he originally presented at the April 22 meeting (Summary of April 22 Meeting of the ICCR Process Heater Work Group). Mr. Gilmer pointed out that the Work Group is behind schedule and suggested focusing on two activities: testing and preliminary findings for the MACT floor.

One Work Group member suggested that the Work Group could continue to develop the preliminary MACT floor for indirect gas-fired units while waiting for version 3.0 of the inventory database to be released. An EPA representative stated that it is important to continue making progress on process heaters burning fuels other than gas.

4.9 MACT Floor

One Work Group member suggested that it is possible to determine preliminary MACT floors using data in the inventory database. Another Work Group member pointed out that the database does not provide information on control techniques such as oxygen trim and air preheating. One Work Group member asked if the Work Group should try to determine the MACT floor for both "Table 1" and "Table 3" process heaters. Work Group members generally agreed that they should address as many types of heaters as possible.

A Work Group member pointed out that a preliminary finding for the MACT floor for indirect gas-fired units has already been developed. Another Work Group member stated that the preliminary finding would be confirmed by determining the floor using the database.

One Work Group member stated that if the current database is used, the preliminary MACT floor determinations will be inaccurate. The Work Group has reviewed the database and found data that are incorrect, but a revised version of the database has not been released. The EPA representative provided that the revised, corrected database is scheduled to be released by December 15. Several Work Group members expressed the need to perform preliminary MACT floor determinations prior to the release date. Work Group members discussed various approaches for incorporating the database corrections into the preliminary MACT determination without waiting for the December 15 release date. Work Group members explained that, in the current database, it is not possible to separate direct- and indirect-fired process heaters. Many direct-fired process heaters have control devices while indirect-fired heaters do not. A MACT floor determined for indirect- and direct-fired process heaters combined would not accurately reflect the actual level of control for either subcategory.

Several Work Group members asked if it is possible for an intermediate process heater database to be released before December 15. The intermediate database would reflect the revisions provided by the Work Group and identify indirect- and direct-fired process heaters. The EPA Work Group Co-Chair agreed to investigate the possibility of an intermediate database.

Work Group members agreed to use the existing database to determine the level of control for process heaters divided by SIC and fuel type, with the understanding that some determinations will be inaccurate for indirect-fired process heaters.

The Work Group discussed existing control devices on indirect-fired process heaters. A representative of the chemical manufacturing industry stated that process heaters in the industry he represents do not have add-on controls for liquid-fuel-fired units although there are some for which the fuel is pretreated. A representative of the forest products industry stated that process heaters in his industry may fire coal, fuel oil and wood and have control devices such as baghouses, scrubbers and electrostatic precipitator.

An EPA representative suggested that the Work Group identify all of the types of control in use, such as controls for NO_X, good combustion practices, fuel pretreatment, and controls for particulate matter (PM). The EPA representative stated that the list of control devices will identify those, such as controls for PM, that the Work Group needs to investigate further.

4.10 Testing

The EPA representative asked if the group could identify any testing needs. A Work Group member suggested reviewing the emission database to find out the type of test data that are already available. The Work Group member also suggested identifying categories with moderate to high potential for dioxin emissions. The Work Group member pointed out that additional information on which facilities have test data will be available through the combustion unit survey. An EPA representative added that preliminary results of the survey will be available in mid-October.

A Work Group member provided that the California Air Resources Board (CARB) has been requiring and collecting emission test data through the Hot Spots program. The Work Group member added that the facilities that are required to be tested are determined based on the risk associated with emissions and are divided into tiers. The Work Group member suggested contacting the CARB to find out the types of facilities for which test data are available.

A representative of the forest products industry provided that he is aware of emission testing performed by his industry. The representative added that although the majority of the test data are for boilers, the data may be applied to process heaters.

One Work Group member suggested testing process heaters with control devices for which the affect on HAPs is not known.

An EPA representative suggested waiting for the release of version 2.0 of the emission test database, contacting the State of California, identifying non-gas-fired units, and reviewing version 3.0 of the inventory database before identifying testing needs.

One Work Group member suggested that industry representatives could investigate controls in place, fuels used and HAPs expected to be emitted from process heaters in their industry. Several Work Group members stated that determining HAPs emitted will be difficult for

direct-fired process heaters. Work Group members agreed to limit the investigation to their knowledge of process heaters.

4.11 Work Group Stakeholder Co-Chairs

The Work Group agreed to recommend that John Ogle and Lee Gilmer retain their positions as Work Group Stakeholder Co-Chair and Work Group Stakeholder Co-Chair Alternate, respectively.

5.0 ACTION ITEMS

- Bill Maxwell will prepare a letter for EPA to send to trade associations representing operators of process heaters not represented by the Work Group. Mr. Maxwell will also alert the Economic Analysis Work Group co-chair of industries not represented on the Work Group.

- ERG will update the tables that provide a breakdown of process heaters by SIC code and fuel type to include process gas.

- Bill Maxwell will encourage EPA to make a decision regarding direct-fired process heaters.

- Bill Maxwell and ERG will work with the information available from the inventory database "weeding" effort and version 2.0 of the database to develop a partial interim process heater database, if possible, to be used until version 3.0 is available.

- Bill Maxwell will contact the California Air Resources Board (CARB) to determine what industries have been covered through the Hot Spots testing effort.

- By November, industry representatives will investigate controls in place for, fuels used by, and HAPs expected to be emitted from process heaters in their industry.

- Bill Maxwell will refine the schedule developed at the meeting and transfer it into the form developed by the Tracking Subgroup. Mr. Maxwell will provide the completed form for Work Group members to review.

6.0 NEXT MEETING

- A conference call is scheduled for October 22 at 11:00 (eastern). The call-in number is (919) 541-4485.

- The next meeting is scheduled for November 20 in Houston, Texas.

These minutes represent an accurate description of matters discussed and conclusions reached and include a copy of all reports received, issued, or approved at the September 18, 1997, meeting of the Process Heater Work Group. Bill Maxwell, EPA.

Attachment 1

Meeting Attendees

Meeting Attendees

Tom Carter, American Portland Cement Alliance
Roy Carwile, Aluminum Company of America
Norbert Dee, National Petroleum Refineries Association
Chuck Feerick, Exxon Company, USA
Bruno Ferraro, Grove Scientific Company
Lee Gilmer, Texaco, Inc.
Greg Johnson, Shell Oil Company
Klane Forsgren, Sinclair Oil
Mary Lalley, Eastern Research Group
Michelle Lusk, Cement Kiln Recycling Coalition
Bill Maxwell, EPA, Office of Air Quality Planning and Standards
Diane McConkey, EPA, Office of General Counsel
Tom McGrath, EER
Andy Miller, EPA, National Risk Management Research Laboratory
John Ogle, Dow Chemical Company
Lawrence Otwell, Georgia-Pacific Corporation
David Schanbacher, Office of Air Quality, Texas Natural Resource Conservation Commission (TNRCC)
Jim Seebold, Chevron Research and Technology Company
Oliver Stanley, Cargill
Dick Van Frank, National Audubon Society (A.W. Butler Chapter)
Richard Waibel, Koch Engineering Company, John Zink Company
Jane Williams, California Communities Against Toxics
Heather Wright, Eastern Research Group

Attachment 2

Agenda
ICCR Process Heaters Work Group

AGENDA
ICCR PROCESS HEATERS WORK GROUP

September 18, 1997
The Omni Durham Hotel
201 Foster Street, Durham, North Carolina

When	What	Who	Outcome
8:00 - 8:15	Open	Bill Maxwell	
8:15 - 10:15	Feedback from/ response to CC meeting/dioxin primer	Bill Maxwell	Work group members review CC discussion, issues, and any direction given; discuss next steps, particularly as pertain to draft response to CC
10:15 - 10:30	Break		
10:30 - 12:00	Development of "Issue List"	All	Work group members develop list of issues that need resolution (e.g., non-gaseous fuels; dioxins/metals; direct-fired heaters)
12:00 - 1:00	Lunch		
1:00 - 2:00	Discussion of testing needs	All	
2:00 - 3:15	Discussion of schedule for Work Group activities	Lee Gilmer	Work group discuss schedule of activities
3:15 - 3:30	Break		
3:30 - 4:00	Discussion of selection of Work Group co-chair	Bill Maxwell	Work group members discuss selection of Work Group co-chair and alternate for next year
4:00 - 4:30	November CC meeting--do we have anything? Agenda for Next Meeting; Next Steps	Bill Maxwell	Work group discuss any items for presentation to CC at November meeting; Work group discuss potential items for next WG meeting, dates of next meeting(s), etc.

4:30	Adjourn	Bill Maxwell

Attachment 3

Process Heaters by SIC and Table

ICCR Database
Process Heaters by SIC and Table

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Table 1 Units	Table 2 Units	Table 3 Units
				ICCR	Other MACT	Direct
not provided	00	2	4		2	2
agricultural production - crops	01	13	32	12		20
agricultural production - livestock	02	13	20	14		6
agricultural services	07	80	132	31		101
metal mining	10	28	75	50	12	13
coal mining	12	1	1			1
oil and gas extraction	13	1096	3411	3398	5	8
nonmetallic minerals, except fuels	14	254	416	15	252	149
general building contractors	15	3	13	11	2	
heavy construction, except building	16	107	155	1	148	6
special trade contractors	17	5	7	1	6	
food and kindred products	20	553	1662	798	47	817
tobacco products	21	2	3	3		
textile mill products	22	28	111	75	5	31
apparel and other textile products	23	2	23	23		
lumber and wood products	24	253	824	138	679	7
furniture and fixtures	25	38	89	76	11	2
paper and allied products	26	204	753	219	524	10
printing and publishing	27	26	70	58	4	8
chemicals and allied products	28	526	2677	2176	255	246
petroleum and coal products	29	3373	8174	4439	3639	96
rubber and miscellaneous plastics products	30	102	361	313	31	17
leather and leather production	31	8	21	21		
stone, clay and glass products	32	950	3210	91	1643	1476
primary metal industry	33	457	3567	3062	120	385
fabricated metal products	34	376	1737	1451	37	249
industrial machinery and equipment	35	173	704	513	48	143
electronic and other equipment	36	119	335	225	19	91
transportation equipment	37	212	1553	1457	27	69
instruments and related products	38	17	45	19	1	25
miscellaneous manufacturing industries	39	30	132	110	11	11
railroad transportation	40	1	1	1		
trucking and warehousing	42	50	131	51	1	79
water transportation	44	10	31	21		10
transportation by air	45	4	2	2		
pipelines, except natural gas	46	39	77	73		4
transportation services	47	8	42	41		1
electric, gas and sanitary services	49	371	1020	800	191	29
wholesale trade - durable goods	50	35	85	50	24	11

ICCR Database
Process Heaters by SIC and Table Continued

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Table 1 Units	Table 2 Units	Table 3 Units
wholesale trade - nondurable goods	51	2180	3208	192	2	3014
building materials and garden supplies	52	3	7		7	
automotive dealers and service stations	55	3	6	6		
eating and drinking places	58	1	1		1	
insurance carriers	63	2	10	9		1
real estate	65	4	4	3	1	
personal services	72	10	29	29		
business services	73	15	29	26	2	1
auto repair, services and parking	75	10	25	21		4
miscellaneous repair services	76	13	47	46		1
motion pictures	78	1	3	3		
health services	80	8	28	27		1
educational services	82	2	6	6		
engineering and management services	87	12	40	32	1	7
private households	88	1	16	15	1	
services, nec	89	3	6	4		2
public admin, executive, legislative, and general	91	2	3	2	1	
public admin, justice, public order, and safety	92	1	4			4
public admin, administration of economic programs	96	1	1			1
public admin, national security and international affairs	97	10	23	9	13	1
nonclassifiable establishments	99	99	203	117	41	45
TOTAL		11,950	35,405	20,386	7,814	7,205
PERCENT				58%	22%	20%

sccsum.xls

Attachment 4

Table 1 (Covered by ICCR) Process Heaters

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Avg per Facility	natural gas	fuel oil	landfill gas	lpg/ propane/ butane	not specified
not provided	00								
agricultural production - crops	01	5	12	2	12				
agricultural production - livestock	02	10	14	1	13	1			
agricultural services	07	20	31	2	30			1	
metal mining	10	11	50	5	30	20			
coal mining	12								
oil and gas extraction	13	1041	3398	3	3247	53		3	95
nonmetallic minerals, except fuels	14	8	15	2	7	5		3	
general building contractors	15	1	11	11	11				
heavy construction, except building	16	1	1	1	1				
special trade contractors	17	1	1	1		1			
food and kindred products	20	236	798	3	700	69		29	
tobacco products	21	2	3	2	3				
textile mill products	22	21	75	4	74	1			
apparel and other textile products	23	2	23	12	23				
lumber and wood products	24	60	138	2	113	25			
furniture and fixtures	25	28	76	3	75	1			
paper and allied products	26	60	219	4	199	20			
printing and publishing	27	17	58	3	58				
chemicals and allied products	28	351	2176	6	2013	138			25
petroleum and coal products	29	269	4439	17	3857	534	4	10	34
rubber and miscellaneous plastics products	30	84	313	4	312			1	
leather and leather production	31	7	21	3	21				
stone, clay and glass products	32	37	91	2	84	7			
primary metal industry	33	335	3062	9	3016	46			
fabricated metal products	34	301	1451	5	1385	66			
industrial machinery and equipment	35	103	513	5	503	10			
electronic and other equipment	36	68	225	3	222	3			
transportation equipment	37	189	1457	8	1447	9			1
instruments and related products	38	11	19	2	13	6			
miscellaneous manufacturing industries	39	17	110	6	110				
railroad transportation	40	1	1	1	1				
trucking and warehousing	42	17	51	3	51				
water transportation	44	4	21	5	19	2			
transportation by air	45	1	2	2	2				
pipelines, except natural gas	46	34	73	2	58	10		1	4
transportation services	47	7	41	6	30	10		1	
electric, gas and sanitary services	49	308	800	3	773	20		3	4
wholesale trade - durable goods	50	19	50	3	48	1			1
wholesale trade - nondurable goods	51	78	192	2	166	23		3	

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Avg per Facility	natural gas	fuel oil	landfill gas	lpg/ propane/ butane	not specified
building materials and garden supplies	52								
automotive dealers and service stations	55	3	6	2	6				
eating and drinking places	58								
insurance carriers	63	1	9	9	9				
real estate	65	3	3	1	3				
personal services	72	8	29	4	24	5			
business services	73	10	26	3	24	2			
auto repair, services and parking	75	8	21	3	21				
miscellaneous repair services	76	11	46	4	46				
motion pictures	78	1	3	3	3				
health services	80	4	27	7	27				
educational services	82	2	6	3	5	1			
engineering and management services	87	8	32	4	26	6			
private households	88	1	15	15	15				
services, nec	89	3	4	1	3	1			
public administration, executive, legislative, and general	91	2	2	1	2				
public administration, justice, public order, and safety	92								
public administration, administration of economic programs	96								
public administration, national security and international affairs	97	5	9	2	9				
nonclassifiable establishments	99	36	117	3	113	3		1	
TOTAL		3,871	20,386		19,067	1,110	7	63	173

Attachment 5

Table 3 (Generally Direct-Fired, No MACT) Process Heaters

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Avg Number of Units	natural gas	natural gas or fuel oil	fuel oil	not specified
not provided	00	1	2	2				2
agricultural production - crops	01	9	20	2				20
agricultural production - livestock	02	3	6	2				6
agricultural services	07	72	101	1				101
metal mining	10	8	13	2	6		1	6
coal mining	12	1	1	1				1
oil and gas extraction	13	5	8	2	4			4
nonmetallic minerals, except fuels	14	76	149	2	31	1	36	81
heavy construction, except building	16	3	6	2	2		4	
food and kindred products	20	327	817	2	19		3	795
textile mill products	22	2	31	16				31
lumber and wood products	24	3	7	2				7
furniture and fixtures	25	2	2	1			1	1
paper and allied products	26	4	10	3				10
printing and publishing	27	2	8	4	8			
chemicals and allied products	28	113	246	2	37		3	206
petroleum and coal products	29	71	96	1	37		50	9
rubber and miscellaneous plastics products	30	9	17	2	3		2	12
stone, clay and glass products	32	403	1476	4	260	1	55	1160
primary metal industry	33	93	385	4	9			376
fabricated metal products	34	70	249	4	8			241
industrial machinery and equipment	35	36	143	4	2		4	137
electronic and other equipment	36	27	91	3	2			89
transportation equipment	37	20	69	3	6			63
instruments and related products	38	4	25	6				25
miscellaneous manufacturing industries	39	4	11	3				11
trucking and warehousing	42	47	79	2				79
water transportation	44	4	10	3	1			9
pipelines, except natural gas	46	3	4	1	1			3
transportation services	47	1	1	1				1
electric, gas and sanitary services	49	11	29	3	2		2	25
wholesale trade - durable goods	50	9	11	1				11
wholesale trade - nondurable goods	51	2103	3014	1				3014
insurance carriers	63	1	1	1				1
business services	73	1	1	1				1
auto repair, services and parking	75	1	4	4				4
miscellaneous repair services	76	1	1	1				1
health services	80	1	1	1				1
engineering and management services	87	2	7	4				7
services, nec	89	2	2	1				2
public administration, justice, public order, and safety	92	1	4	4				4

SIC Description	2-Digit SIC Code	Number of Facilities	Number of Units	Avg Number of Units	natural gas	natural gas or fuel oil	fuel oil	not specified
public administration, administration of economic programs	96	1	1	1				1
public administration, national security and international affairs	97	1	1	1				1
nonclassifiable establishments	99	37	45	1	1		2	42
TOTAL		3595	7205		439	2	163	6601

Attachment 6

General Descriptions and Possible Contacts for Outstanding Table 1 SICs
(possible contacts not available electronically, see docket copy)

General Descriptions and Possible Contacts for Outstanding Table 1 SICs

2-Digit SIC	Plant Names	Plant Descriptions	Combustor Descriptions
20 Food and Kindred Products	Kellogg Kraft Frito Lay	Baked goods Beef packing and rendering Breakfast food Dog and cat food	Fryers Bake ovens Milk driers Nut roasters Snack foods Coffee roasters Grain dryers (few) Sugar dryers
34 Fabricated Metal Products	Chevron Reynolds Rohr Hayden Griswald Laidlaw U.S. Can Cadillac forge companies	Automotive manufacturing Auto parts manufacturing Electroplating Foundries Steel mills Misc. Metal manufacturing Steel springs Steel wire Blast furnaces	Presses Parts washer Paint booth Tempering Annealing Heat treating Forge furnace
35 Industrial Machinery and Equipment		Castings Auto a/c equipment Air moving equipment Bearings Construction machinery Diesel engines Metal products Farm and garden products Drives and gears	Heat treating Foundries Hydraulic presses Heaters Tempering units Sweat furnace Bake oven

General Descriptions and Possible Contacts for Outstanding Table 1 SICs

2-Digit SIC	Plant Names	Plant Descriptions	Combustor Descriptions
36 Electronic and Other Equipment	Johnson Controls GE Magnetek Northrup Gruman	Electronic components Audio products Wiring devices	Oven Curing oven Drying oven Bake oven Annealing oven a lot of misclassified units (parts washers, A/C and space heater, etc.)
37 Transportation equipment	GMC Champion Rohr Chrysler Ford TRW Cessna Cadillac plastics manufacturers Union Tank Marinette Marine	Aircraft engines Auto components Auto manufacturing Diesel engine manufacturing Grey iron foundries Helicopters Linkage Military airplanes Rail cars Ships	Auto claves Parabolic furnace Crucible Inert gas generator Space heater Brazing Paint sludge dryer Coil draw furnace Heating Drying Tempering Hardening Carburizing

General Descriptions of Table 1 2-Digit SICs

2-Digit SIC	Plant Names	Plant Descriptions	Combustor Descriptions
49 Electric, gas and sanitary services	Dow PPG pipeline - natural gas refineries Columbia gas Owens-Corning James River	Agricultural waste Asphalt Benzene Gas compression Gas production Paper mill Natural gas processing, compression, and transmission Oil and gas production Refining Paper curing	Dowtherm heater Glycol heater Process heater Fuel oil heater Dehydrator Desulfurizer unit heater Salt bath heater Storage heater Engine heater In-line heater